

TOWN OF BEDFORD, NEW YORK

Study and Report of Emergency Service and Wireless Telecommunications Infrastructure Master Plan

Project Initiation Meeting Presentation



Susan Rabold, Project Manager

November 20, 2019 7:30 pm – Bedford Hills Community House
74 Main Street, Bedford Hills

CityScape Consultants, Inc.

CityScape CONSULTANTS, INC.



- Company started in Florida in 1997
- Offices in Florida, Georgia, North Carolina and Washington, DC
- Exclusively serve government clientele with unbiased information
- Company goals and objectives consistent with Federal Statutory, Decisional and Regulatory Law
- Assists local government with:
 - **Wireless Telecommunications Master Planning**
 - **Site Application Engineering Review**
 - **Ordinance Review**
 - **Leasing and Development of Public Land**



- Company began 36 years ago
- Over 50 full-time employees
- Specializes in public safety communications
- Provides consulting services for the full life cycle of public safety radio system and 9-1-1 system projects
- Knowledge includes:
 - **Land Mobile Radio Systems**
 - **Land Mobile Radio Technologies**
 - **Broadband/Advanced Wireless Technologies**
 - **Frequency Bands**
 - **Manufacturers Systems and Equipment**
 - **Backhaul systems**

Scope of Services Overview

- TASK 1: Project Commencement and Project Initiation
 - Preliminary research
 - Timelines
 - Project Initiation meeting
- TASK 2: Infrastructure Assessments
 - Operational and emergency radio telecommunications needs
 - Public Safety Interviews & Assessment
 - Infrastructure Assessments
- TASK 3: Inventory Catalog
 - Public Safety Assessment Data Review
 - Infrastructure Assessment Data Review & Draft Inventory Catalog
- TASK 4: Engineering, Preliminary Mapping and Analysis
 - Engineering Analysis & Propagation Mapping
 - Public Safety Analysis & Mapping

Scope of Services Overview

- TASK 4 Continued: Engineering, Preliminary Mapping and Analysis
 - Remote Public Safety Teleconference
 - Public Workshop
- TASK 5: Ordinance Review and Amendment Recommendations
 - Review Existing Land use Development Standards & Processes
- TASK 6: Draft Wireless Master Plan
 - Emergency Response Radio System Master Plan
 - Draft Wireless master Plan
- TASK 7: Project Completion
 - Submittal of Final Wireless Master Plan Documents
 - Master Plan Presentation



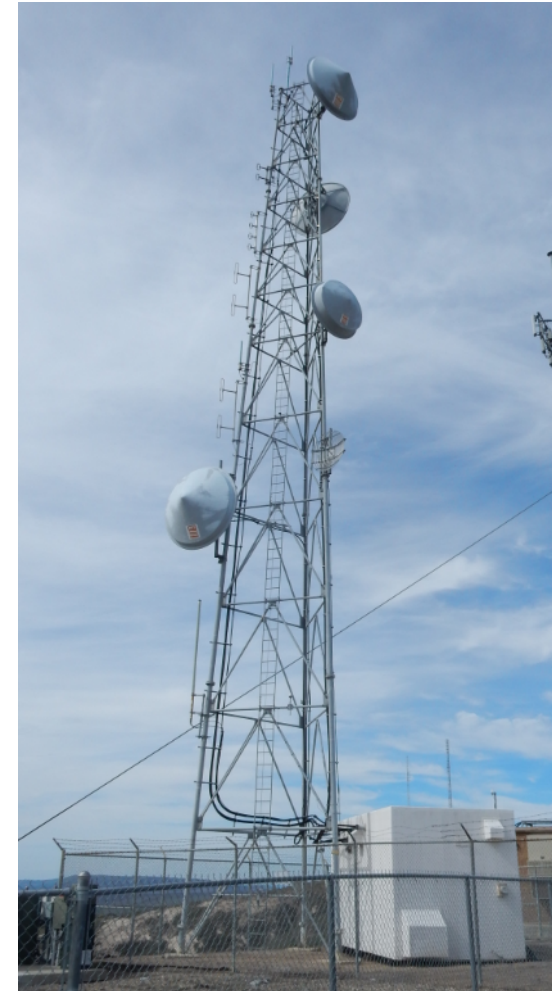
"Unleashing the Power of Technology"

**Federal
Engineering®**

Public Safety Project Description

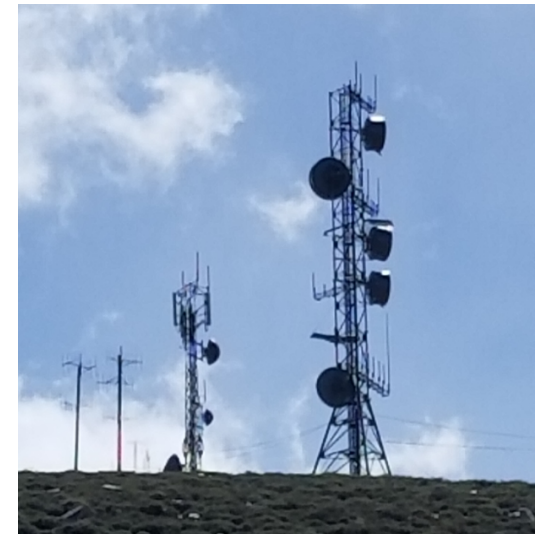
Public Safety Radio System Assessment

- Assess existing Police, Fire, EMS and Public Works radio systems and make recommendations for system upgrade or replacement
- Needs Assessment
 - Stakeholder questionnaire and interviews
 - Coverage, interoperability, reliability, capacity
- Existing System Assessment
 - Request for Information
 - Site surveys
 - Radio coverage analysis



Public Safety Radio System Assessment

- Work with the Town to identify alternatives for analysis
- Radio Coverage Analysis
 - Identify potential new sites
 - Conduct coverage workshop
 - Develop proposed site list for each alternative
- Analyze each alternative for its ability to meet stakeholder needs
 - Radio coverage, channel capacity, interoperability and cost
- Draft Assessment and Recommendations Report
 - Existing system assessment and stakeholder needs
 - Alternatives analysis
 - Recommendations
 - Next steps
- Review Draft Report with the Town and develop Final Report





Commercial Wireless Master Plan Description

Introduction to Wireless Telecommunications Personal Wireless Service Facilities (PWSF)

Infrastructure initially built for cellular phones now upgraded and constructed for cellular phones, tablets and smart devices



Wireless Telecommunications History



1G



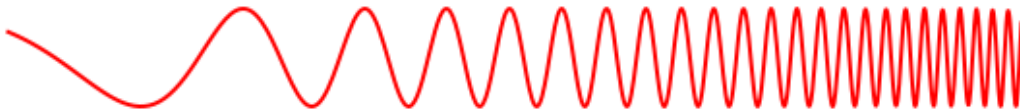
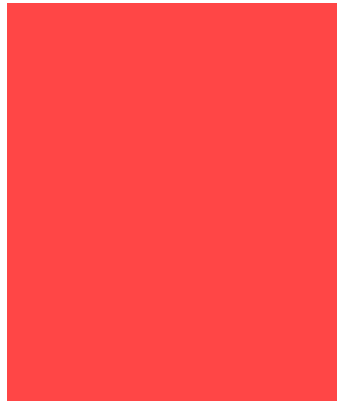
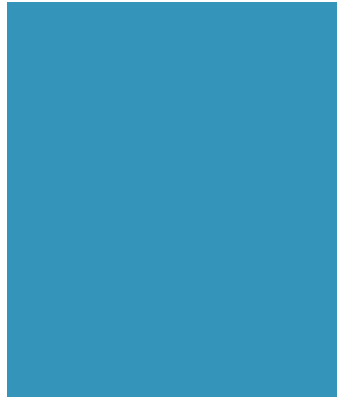
2G & 3G



4G

- 1G service provided voice calls only.
- 2G service included voice, texting and data.
- 3G service offered in early 2000's improved data speeds.
 - iPhone in 2007 offers thousands of applications.
- 4G service on AWS and LTE began around 2010 and increased data speeds; included new 700 and 2100 MHz frequencies.
- 5G service wireless network densification by adding small wireless facilities connected with fiber optics either above or below ground.

Site Location Considerations *Spectrum,* Coverage, Capacity



- Wireless service providers do not all use the same frequencies
- Lower frequencies (700-850 MHz) propagate further than higher frequencies (1900-2400 MHz)
- Higher frequencies allow signals to penetrate buildings
- Spacing of cell sites in rural areas is influenced greatly by the frequencies that a service provider can use in an area
- Capacity in suburban and urban areas influenced greatly by the number of simultaneous subscribers maximizing apps on devices
- More use of data intensive applications such as Facetime, Internet, Streaming Music and HD Movies, Social Media, etc.
 - Over 49% of U.S. households have “cut the cord” and are wireless only
 - 45 million Americans use mobile phones as their primary Internet access device
 - Smart houses, smart cars, smart industry

Quick Facts:

The number 330% is rendered in a stylized, rounded font. The first two '3's are green, and the '0' and '%' are blue. The digits have a slight 3D effect with darker shading on the right side.

growth in health & fitness apps
over the last three years.

The number 76% is rendered in a stylized, rounded font. The '7' is green, and the '6' and '%' are blue. The digits have a slight 3D effect with darker shading on the right side.

of travelers say a
mobile phone is the most
important trip accessory.

The number 85% is rendered in a stylized, rounded font. The '8' is green, and the '5' and '%' are blue. The digits have a slight 3D effect with darker shading on the right side.

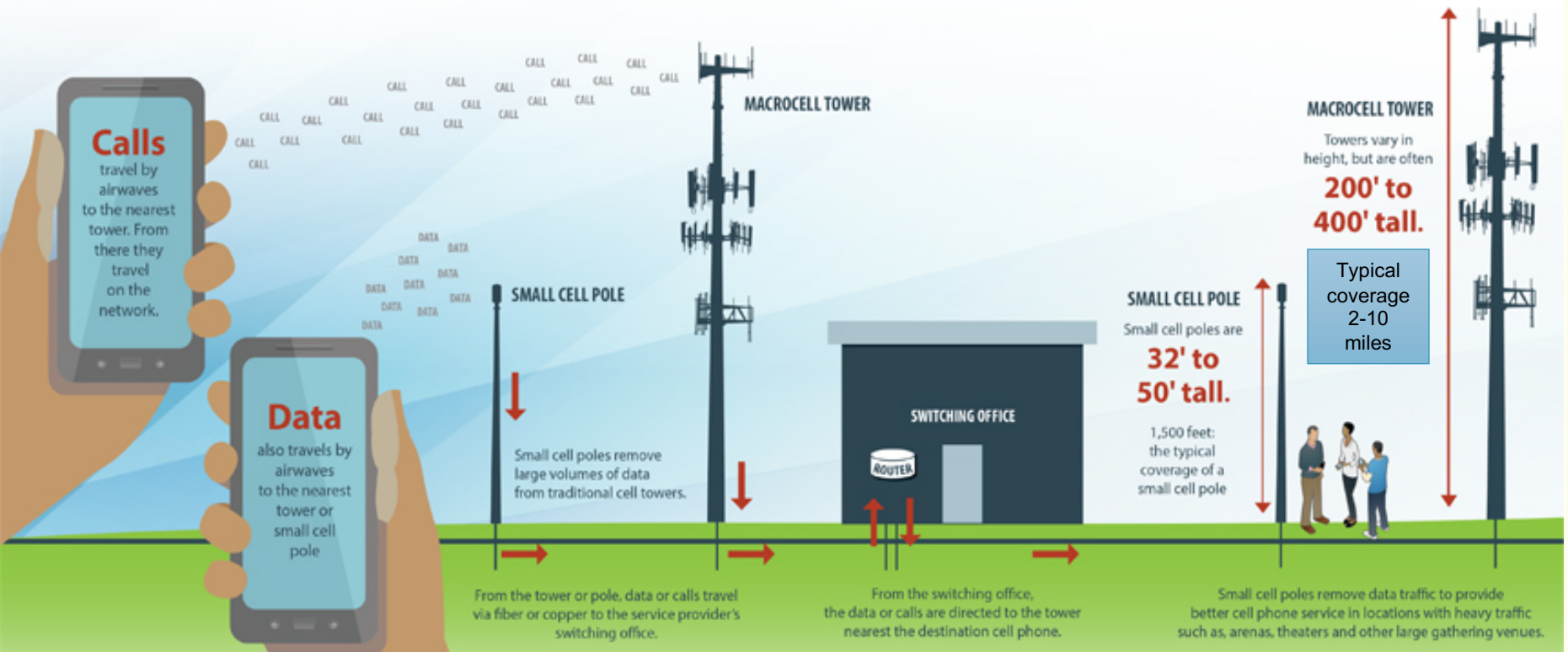
of photos taken in 2017 were
captured on a smartphone

The number 31B is rendered in a stylized, rounded font. The '3' and '1' are green, and the 'B' is blue. The digits have a slight 3D effect with darker shading on the right side.

connected devices
predicted by 2023.

Facility Types

Macro Cell and Small Cell



Macro Cell Infrastructure



Microwave
commonly used
for backhaul



Panel Antennas
with RRU's



Omni-directional
whip type
antenna

Macro Cell Ground Equipment



Typical Low Frequency
(700-850 MHz) Ground
Equipment



Typical High Frequency
(1900-2400 MHz) Ground
Equipment

Macro Cell Towers Non-Concealed



Monopole
Self Support



Lattice
Self Support



Guy
With Support

Macro Cell Towers Concealed



Clock Tower



Bell
Tower/Religious
Institution



Faux Tree



Small Cell Wireless Facilities Non-Concealed

- Antenna mounted to the side of the pole with equipment at base of pole on the ground
- Antenna mounted on top of pole with equipment attached to pole

Small Cell Wireless Facilities



Ground Equipment

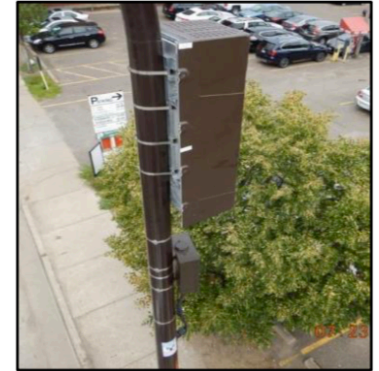
ACTUAL STREETLIGHTS AS SMALL CELL SITES



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22

ACTUAL STREETLIGHTS AS SMALL CELL SITES



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24

Small Cell Wireless Facilities Non-Concealed



Small Cell Wireless Facilities Concealed

- Antenna no more than three cubic feet
- All other equipment no more than 28 cubic feet in volume





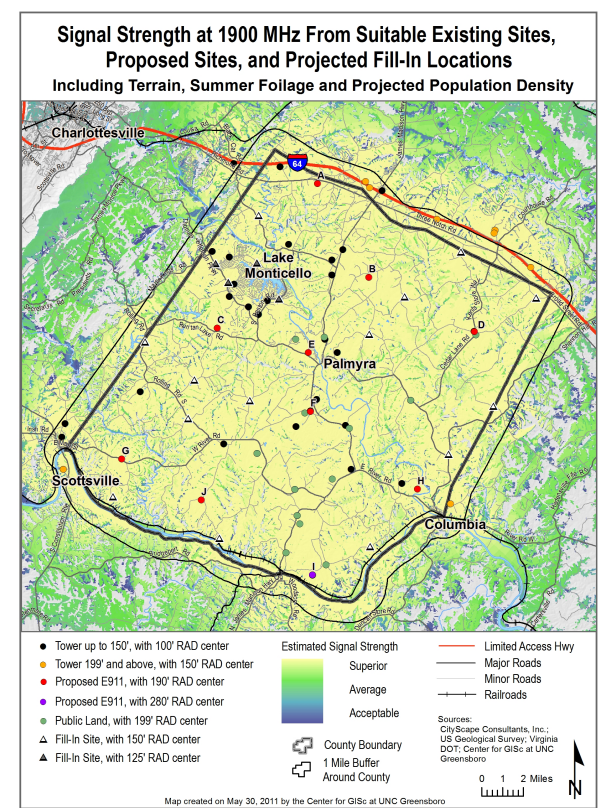
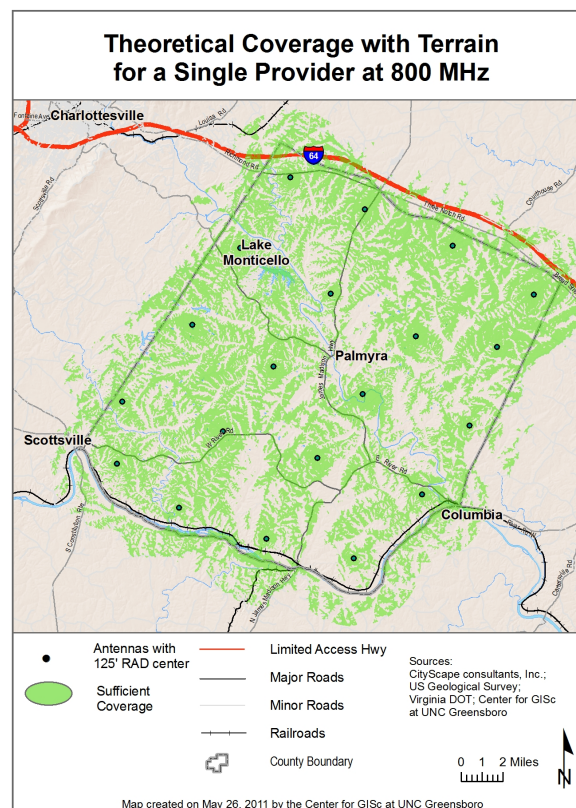
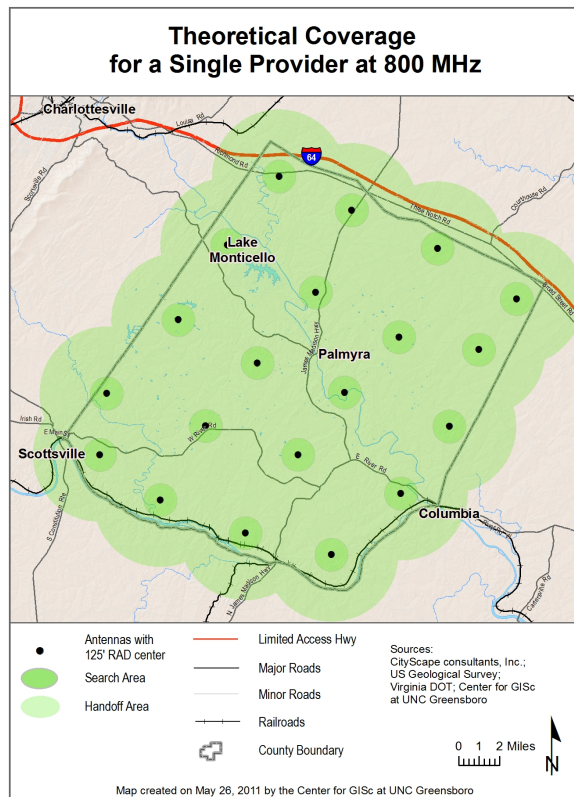
Small Cell Wireless Facilities Concealed

- Light poles can be painted different colors
- Various options for light fixture
- Banner options
- Planter options

Small Cell Wireless Facilities Concealed

PHOTOSIMULATIONS OF STREETLIGHTS AS SMALL CELLS





Master Plan Example

Federal
Statutory,
Decisional
and
Regulatory
Law

Wireless Telecommunications Regulatory Parameters

Federal Legislation Section 704

47 USC §332(c)(7)

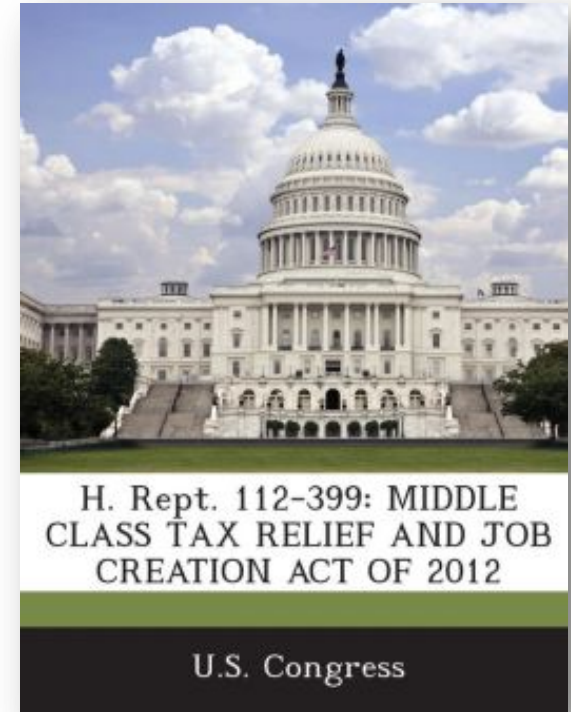
(a/k/a Section 704 of the Telecommunications Act of 1996)

Preservation of state and local zoning authority regarding placement, construction and modification of personal wireless service facilities, however the regulations shall not:

- Unreasonably discrimination among providers of functionally equivalent services
- Prohibit or have the effect of prohibiting the provision of personal wireless services
 - Shall act on requests within a reasonable time period
 - Provide denials in writing and supported in substantial evidence contained in a written record
 - Cannot regulate environmental effects of radio frequency (RF) emission beyond the Commission's regulations concerning such emissions
 - Can require a statement that facility complies with the Commission's regulations concerning such RF emissions

Middle Class Tax Relief and Job Creation Act of 2012, Section 6409A

- Notwithstanding Section 704 of the Telecommunications Act of 1996 or any other provision of law, a State or local government may not deny, and shall approve any **eligible facilities request** for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station.
- Eligible facility request means any request for modification on an existing wireless tower or base station that involves:
 - Collocation, removal or replacement of new transmission equipment.



Collocations Permitted by Right Provided Application Does Not Exceed Definition of Substantial Change

Collocation means:

- Mounting or installing equipment on an eligible support structure.

Eligible facility request means:

- Any request for modification of an existing tower or base station that does not substantially change the physical dimension of such tower or base station.

Eligible support structure means:

- Any tower or base station provided that it is existing at the time the relevant application is filed.

FCC's Report
and Order #3
Accelerating
Wireless
Broadband
Deployment by
Removing
Barriers to
Infrastructure
Investment

Unless a written agreement
between Applicant and siting
authority

**10-days to review initial application for
completeness; if incomplete, must specify
missing documents or information needed for
completion**



Application review timelines:

60 days to
collocate a
small wireless
facility using
an existing
structure

90 days to
collocate non-
small wireless
facilities using
an existing
structure

90 days to
deploy a small
wireless
facility using a
new structure

150 days to
deploy a non-
small wireless
facility using a
new structure

Next Steps



Complete Task 3: Finalize commercial and emergency services inventory catalog (November 21 – December 6).



Complete Task 4:
Mapping and analysis
(Now – January 3, 2020)

Engineering Analysis and
Propagation Mapping
Public Safety Analysis and Mapping
Public Workshop Tentatively Early
January 2020



Questions

